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**Report on ONR grant for a multimedia text:
Principals of Parallel Algorithms Implementation
PI: John Reif**

ABSTRACT

The goal of the project was to transform the book, *Synthesis of Parallel Algorithms* (John Reif, editor), into a CD-ROM suitable for inclusion with other materials for graduate level courses and reference material. During the year covered by the grant, the popularity of the Internet and the World Wide Web exploded, resulting in a change of focus for the project. The idea for a CD-ROM disk as originally envisioned was dropped in favor of making the multimedia version of the book available via the World Wide Web, thus making the material more easily available to the scientific community and the world at large. Chapter authors publish their chapters at their own Internet sites and maintain the sites, updating the information as the field of parallel algorithms evolves, resulting in a multimedia text which is truly dynamic, avoiding the problems associated with distribution and verification that the information presented remains current - a task that is impossible with a static medium such as a CD-ROM disk.

It should be emphasized that the objectives of the grant - to produce a multimedia and highly accessible version of the textbook - were largely accomplished in an online form at a significant savings in cost (most of the funds were returned).

REPORT

As proposed, the goal of this project was to take the text of the book, *Synthesis of Parallel Algorithms* (John Reif, editor), and transform it into a multimedia package for CD-ROM distribution. The most likely recipients of the resulting disks would be libraries, universities, and researchers involved in theoretical parallel algorithms. The world has changed since the proposal was originally envisioned, and the Internet has become widely used, not only in the academic and business research communities, but also in many schools and homes in this country and around the world. It is now common practice for researchers to publish results not only in scientific journals and conference proceedings, but also on their World Wide Web (WWW) sites. The principal investigator felt that with the new developments and popularity in the WWW, the goal of the proposed CD-ROM, to distribute information on parallel algorithm design and theory to graduate level students and researchers, would be better served by publishing the same multimedia material in a more widely available format, the WWW, thus widening the possible audience for the information and reducing costs by foregoing the expense of producing a CD-ROM. Furthermore, a CD-ROM disk would be a static source of the material, perhaps outdated as new methods and discoveries were uncovered. By publishing the material on the WWW, the information can be presented in a dynamic form, maintained by the chapter authors to constantly reflect changes in methodology and technique as the field evolves.

METHODS

In the first phases of the project, chapter authors were contacted to submit edits to their chapters. Many of the authors were busy with classes, research, or travel, and several months passed with only minimal response despite repeated requests. Further delays were encountered when it was discovered that the LaTeX chapter files had been changed by a company hired by the book's publisher, Morgan Kaufmann, during their original publishing process. This resulted in delay and expense as the files had to be converted back from this proprietary format, using the same company hired by Morgan Kaufmann originally. Furthermore, this work didn't completely restore

the files as they had been when originally submitted to Morgan Kaufmann. It seems that several LaTeX styles were used that are particular to Morgan Kaufmann, and also that the files were changed so that they could be linked together to run as one big file- the whole book. When this work was undone, the files still would not run as individual chapters. Extra files, style files, and directions had to be sent to each of the chapter authors in order to get past these problems, with only limited success. Finally, most authors responded with either new versions of their chapters or the message that their chapters did not need to be updated, and were in acceptable format to be converted to the hypertext version of the book.

Possibilities were investigated for including sound and video with the text and figures from the book. Specifically, video recordings of the chapter authors presenting their material or audio recordings of the authors describing their current research were considered, but scheduling problems, combined with wide geographic distribution of the authors, made such recording problematic.

During this time, it was realized that the WWW was perhaps a more appropriate medium for distribution of the text material than a CD-ROM might be. An advanced graduate student, Surender Chandra, was hired to code a protocol for transforming the LaTeX output generated by the chapter files into HTML code suitable for posting to the World Wide Web. His work resulted in self-coding HTML documents, where each citation within the text was linked to the bibliography for that chapter, each reference to another section was linked to that section, and the table of contents was linked to chapters and sections for the entire text.

In an attempt to encompass as much of the multimedia experience as possible without sound and video, authors were requested to submit photographs of themselves along with short biographies and copies of their CV's, all of which could be hypertext linked from their chapter headings. As this request was largely redundant (Most authors have this information on their WWW homepages already) authors were left to include this information at their own discretion.

By the time the grant had expired, many of the chapter authors had their chapters available on-line with links in place. The nature of the Internet and World Wide Web had made the need for a centralized repository of the files obsolete, and the expense of producing a CD-ROM disk unnecessary.